Uritek TC-101

User's Manual

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TECO DIAGNOSTICS

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WARNING

1. Please read the User's Guide before you operate this instrument. The power requirements comply with Part I of IEC61010-90.

2. Please contact the manufacturer if trouble occurs.
3. Do not look at the optical light source at the opening of strip placement with bare eyes.
4. Do not unassembled any cover of the instrument without the instruction of manufacturer.
5. Do not touch any internal parts of instrument for avoiding any accident without the instruction of manufacturer.
6. To handle urine specimen and reading strip, safety gloves are recommended.
7. To perform daily cleaning, maintenance, and troubleshooting, safety gloves must be used. Further detail maintenance and precaution is stated in Chapter 7.

CHAPTER 1

INTRODUCTION of URITEK TC-101 URINE ANALYZER

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Urine analysis is completed through the colorimetric method by distinguishing the different colors generated by chemical reaction between the reagent pad and the urine. The conventional testing way visually determined the color difference between test reagent pads with the color chart provided and recording test results. However, visual determination for urine analysis is now considered out-dated and a time consuming method. In addition, visual testing is prone to inaccurate results due to human error and changing light source. As a result, Urine Analyzer became a logical replacement to minimize variables, thereby, making urine analysis an accurate and cost effective diagnostic tool.

URITEK TC-101 Urine Analyzer is designed combining modern optics, electronics, and computer technology with other sophisticated technologies. The advance super-high cold light source testing technology is applied in optics, enhancing the discerning ability of optical system and highly reducing the influence of ambient light on test. In system structure, modular system design and large-scale integrated circuit have been adopted to reduce the interference of each fixture of system and improve its reliability and stability. Moreover, URITEK TC-101 Urine Analyzer is convenient for daily maintenance and repair. And this instrument also enhances the revising ability of pH versus specific gravity and eliminates the influence of uric acid and alkali on the test urine specific gravity.

The "User-friendly" system configuration of URITEK TC-101 Urine Analyzer with functionality and convenience as its design principle make everything perfect. URITEK TC-101 Urine Analyzer has been developed into such instrument integrating urine sample test, data result management, random diagnosis, material support and other functions.

The package has the items:

No.	ITEM	Quantity	Remarks
1	Urine Chemistry Analyzer		URITEK TC-101
2	Printing paper	1 roll	Thermal paper
3	Power adapter		
4	Power Cord	2	Euro and US
5	Operator's Manual		

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CHAPTER 2

SPECIFICATION of URITEK TC-101 URINE ANALYZER

2.1 Specification of Uritek-101 Analyzer

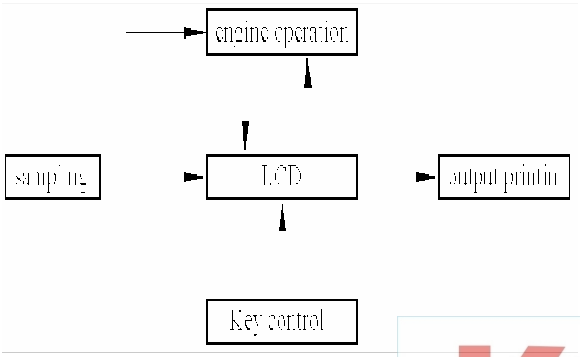
- Test principle: Super-high cold light source reflecting
- Measuring method: adopts integrating sphere dual wavelength to measure the variation of color of the strip block.
- Automatic self-calibration once power is turning on
- Testing items: Leukocytes, Nitrite, Urobilinogen, Protein, pH, Blood, Specific Gravity, Ketone, Bilirubin, Glucose and Ascorbic Acid
- Test Speed: 60 specimens/hour
- Reaction cycle: 60 seconds
- Display form: LCD
- Wavelength of Monochromatic light: 525nm, 620nm, 720nm
- Data Base memory: up to 1000 test results
- URS-2P, URS-4S,URS-8, URS-9, URS-10, and URS-11 testing functions
- Internal heat-sensitive printer equipped
- Available language: English, Spanish, and Chinese
- Environment requirement: +10 ~ +40 ; RH≤95%
- Power source:

Input: AC220V (± 10%)/ 1.0A, 50 (± 1Hz);
AC110V (± 10%)/ 1.0A, 60 (± 1Hz)
Output: DC9V (± 10%)/ 1.0A

- Net weight: 2kg

2.2 Design Principle

Chart of work principle of TC-101 as a whole



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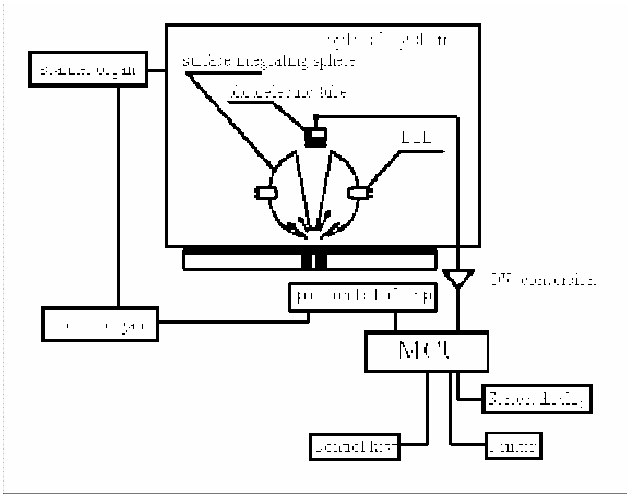
2.3 Measuring Principle

Measuring principle: adopts cold-light source testing technology.

Chart of the principle of sampling part



TC-101 measurement is based on the different colors on blocks of the strip irradiated by light. Its reflex will be received by integrating sphere and will be taken as measuring light wave through the three wavelengths 525nm, 620nm and 720nm in the integrating sphere. It will take light of 720nm wave length as the reference wave light and

and take different testing wave lights according to the color reaction of different items. The proportion of different wave lengths will be decided by different tested items and test results will be decided based on the above proportion (reflex rate R%), and data of each test will be printed automatically. If content of a certain composition of the urine is high, the reflex of the corresponding strip block will be dull. Contrarily, if certain composition content is low, the reflex of its corresponding strip block will be bright.

Apart from strip blocks for corresponding items, it also has introduced reference block (blank block) on the strip. Its function is to rectify the error that may be caused by different urine samples. The formula of reflectance is as follows:

$$R\ (\%) = \frac{Tm \cdot Cs}{Ts \cdot Cm}$$

R = Reflectance
Tm = Reflect intensity of strip block to testing wave length
Ts = Reflect intensity of strip block to reference wave length
Cm = Reflect intensity of reference block to testing wave length
Cs = Reflect intensity of reference block to reference wave length

CHAPTER 3

SETUP of URITEK TC-101 URINE ANALYZER

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3.1 Conditions for installation and usage of TC-101

1. TC-101 shall be installed on a clean, flat and stable platform and shall be avoided to use in place under direct sunlight, with strong electromagnetic wave interference or water splashes.
2. TC-101 shall be installed in a workroom with temperature and humidity that meet its work requirements.
3. TC-101 shall be protected again excessive dust erosion.
4. The plug of TC-101 power shall be connected with socket with good grounding.

3.2 Instrument installation

Install TC-101 on a platform conforming to its working conditions. Insert the fan-out of the switch power into the power inlet at the back of TC-101. Connect the other end with the power.

3.3 Printing paper installation

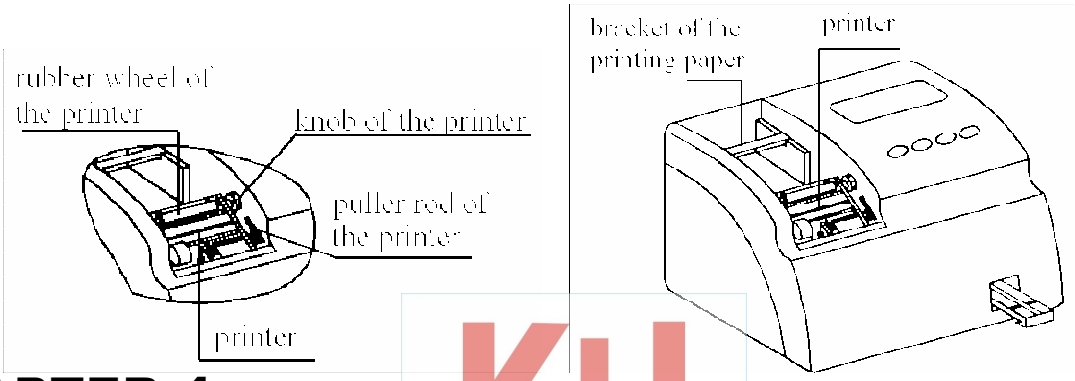
1. Check whether the printing paper is dry before installation. If it is affected with damp, please replace it immediately, lest the printer will lock the paper.
2. The printing paper has its right side and reverse side. Only the right side can be printed. If the paper is installed reverse, please install it again.
3. Don't print when there is no printing paper, otherwise the printer head may be damaged.

3.4 Two ways for installation of printing paper.

1. Connect the power and switch on TC-101, remove the cover of the printer. Pull up the puller rod of the

printer. Put the special heat-sensitive printing paper under the rubber wheel of the printer with its right side down. The printer will detect the printing paper and paper will advance 2-3cm out automatically. Put down the printer switch and select the Paper feed in the menu, and press to confirm and make the paper advance out enough length. Remove the rack of the printing paper and penetrate it through the hole in the heart of the paper scroll. Put the paper and the rack back onto the paper groove, and fix the rack in the rack groove. Let go the paper scroll, and penetrate the paper through the slot on the printer cover. Put on the cover.

2. Connect the power and switch on TC-101, remove the cover of the printer. Pull up the puller rod of the printer, putting the special heat-sensitive printing paper under the rubber wheel of the printer with its right side down. The printer will detect the printing paper and the paper will advance 2-3cm paper out automatically. Pull up the puller rod of the printer again and put the printing paper under the rubber wheel of the printer with right side down. Turn the printer knob and make the printing paper convey enough length. Then install the paper onto TC-101 according to the above method and put on the cover.



CHAPTER 4

OPERATION of URITEK TC-101 URINE ANALYZER

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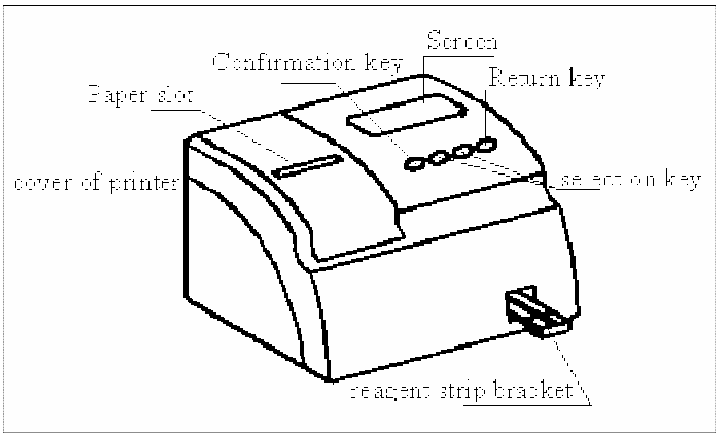
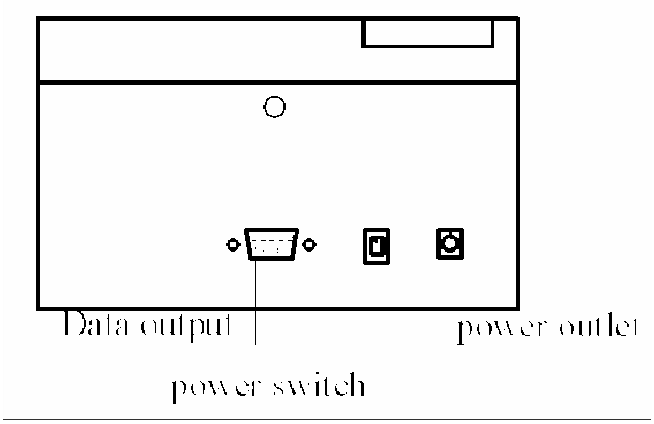
4.1 Name of parts of TC-101



Elevation



Back elevation

4.2 Operation of TC-101

A. Initial Start Up

Check and make sure that the apparatus is installed correctly, turn the power on, the screen will display its starting interface (as seen in Figure1). Immediately on start up the instrument will perform a short self diagnosis. The reagent strip rack will exit, enter the unit once. Press [ ] and you can enter into the operational menu (shown in Figure 2). If during the self diagnosis there is a problem then a trouble shooting code will be displayed. Refer to the trouble shooting lists for further instruction.

When operating the instrument pressing [ ] once will get you to the main menu. In the following example you will be shown how to run a specimen using the URS-10 parameter strip.

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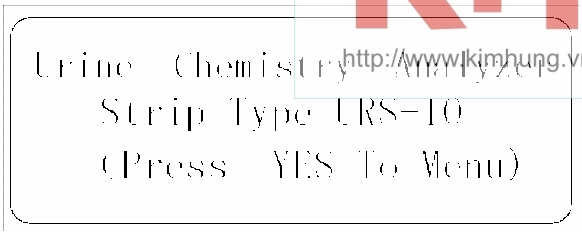


Figure 1

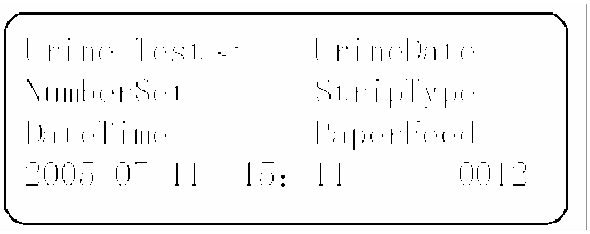
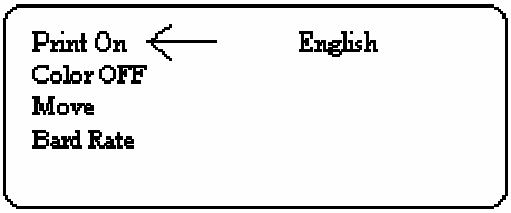


Figure 2

B. Print On

The default printer setting for the TC-101 is printing through the internal thermal printer. The TC-101 can also print using an external stylus printer. These settings can changed using the “Print on” in the “Parameter” menu. When using an external printer the status of that printer cannot be controlled using the TC-101. Make sure the external printer is on and working properly when being used in conjunction with the TC-101.



IMPORTANT: “Print on” Settings can only turn the internal thermal printer on and off. When using an external printer those settings are not controlled by the TC-101.

The status of the internal thermal printer is “Print On”. This setting basically menas that the printer will automatically pring out every test result. In order to turn off the printer select “Print On” in the “Parameter” menu and press . This will turn off the printer and the setting will say “Print Off”.

C. Color On

The apparatus test can choose “Color On” state, if can’t need print color and press setting for “Color Off”. Press still back main menu.

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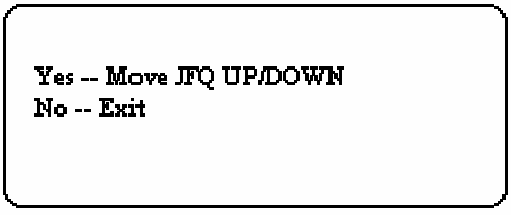
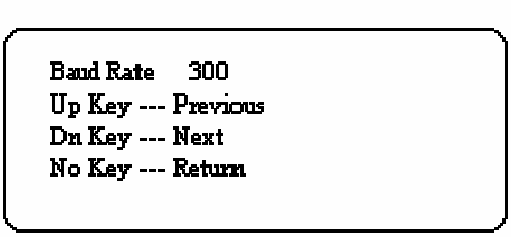
D. Move

The “Move” item in the apparatus menu is used in apparatus maintenance. Choose “Move” in “Parameter” menu and press and enter into the operational menu, you can control the running conditions of each motor using the keyboard.



E. Bard Rate

The bard rate setting for the apparatus is 300, user can choose 300,, 600, 1200, 2400, 4800, 6900, 19200, 38400, 57600, 115200, and parting press or Choose.



F. English

The language setting for the apparatus is English. The print format is as follows:

No 0001
Date 2003-06-02
Time 17:25
VC >=6.0 mmol/L
GLU Negative
BIL Negative
KET Negative
SG >=1.030
BLD Trace
PH 5.0
PRO Negative
URO 3.2 umol/L
NIT Negative
LEU Negative

G. Running a Test

Make sure the strip type is correct (Figure 1). In order to run a specimen, press ___ on the menu when the selection arrow is pointing to the urine test. The instrument will beep once. Notice the counter on the bottom right hand corner of the display (Figure 3), it will be counting down from 5 seconds. During these 5 seconds dep the strip into the urine specimen according to Urine reagent strip instructions. The instrument will then beep 6 times consecutively and count down from 60 seconds. Remove all excess urine by dabbing the test strip on absorbent paper. Place the strip on the strip bed, the instrument will beep once when recognizing the strip. See figure below for proper placement of strip. When testing URS 2P and 4S the strip length is shorter than the other strips so the strip should end where the line is drawn on the strip bed. At 21 seconds on the countdown the instrument will beep twice and the strip bed will begin to enter the machine. If the strip has not been properly placed on the bed by this point there will be an error message. The instrument will read the strip at 1 minute and will immediately print the results afterwards.

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Caution:
After dipping the strip in the urine dab on absorbent paper to clear excess urine. Excess urine on the strip can damage the machine.

The display will show the result of the last test printed. The screen on the display will show the results of 3 parameters (Figure 3). View the other parameters by pressing ___ or ___. Pressing yes again while in viewing the previous test will begin a new testing cycle.

Caution: use proper procedure for dipping urine strips

A. The urine strips should be dipped in the sample for 2 seconds.
B. Timing is crucial. If the urine strip is dipped too late or too early then the results could be affected.
C. Do not use urine strips more than once.
D. If there is an error message (Trouble), troubleshoot the problem before attempting to run a test.

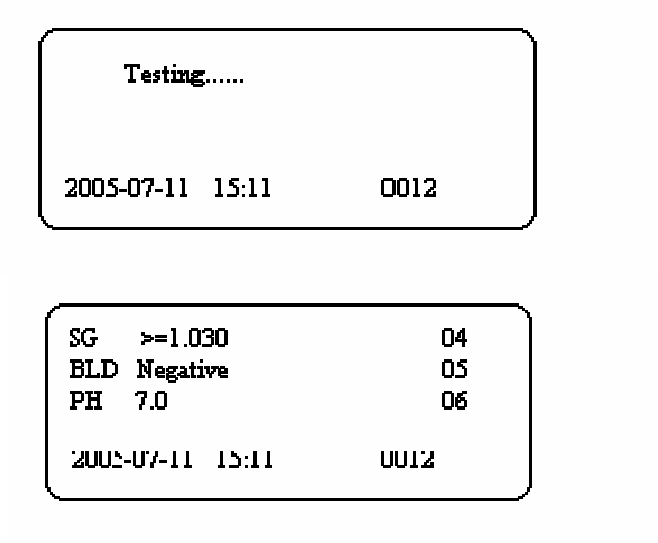

Figure 3

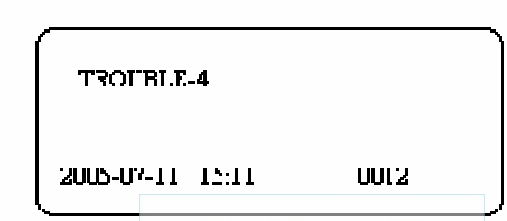

Figure 4: Malfunction Interface

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4.3 Setting of Number

TC-101 can set numbers on the data of the tested specimen according to the need of customers. During the operation, choose Number Set in the main menu, and press TC-101 will enter into its operational interface (as in Fig 3). Then the numbers shall be set according to the following method.

1. Press △ once, the number will be increased by 1, press ▽ once, the number will decreased by 1.
2. Hold △ or still, the number will increase or decrease continuously. If you hold at the same, the number will increase or decrease by 10. After the setting, press to return to the operational menu. At this time, the numbers displayed in the menu are those set by users. The test of TC-101 will increase progressively from this number.

⚠ After the numbers are reinstalled, TC-101' storage memory will be the latest testing data and it will cover the old data of the same numbers.

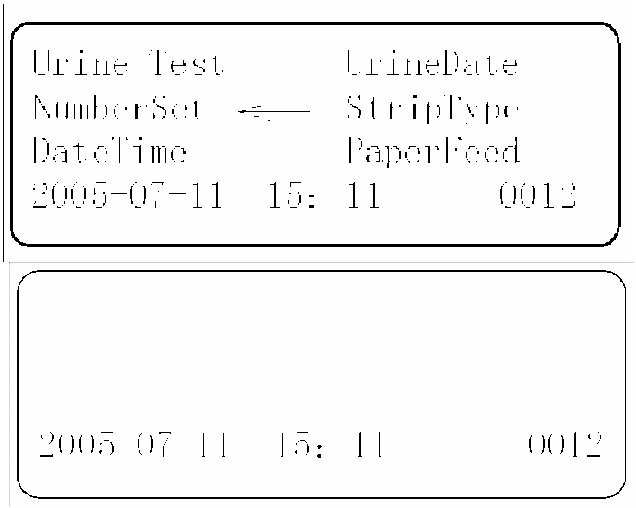

Figure 3

4.4 Setting of Date

Choose Date Time in the operational menu and press and make the cursor move to “time” or “date”. By pressing or you can increase or decrease the Date or Time by 1(as in Fig 4).

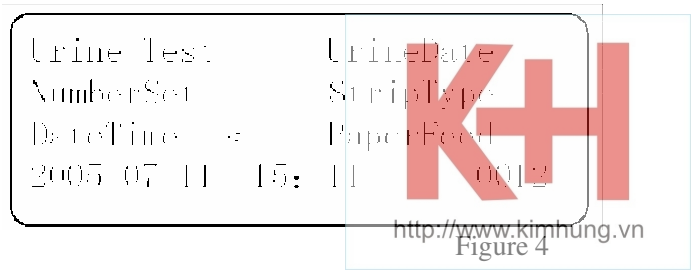

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Figure 4

⚠ Only when the flashed cursor is placed on the item can it be revised.

2. Searching for data

Choose Urine Data in the operational main menu and press to enter into the operational interface (as in Fig 5). Press in this interface to see the last line, and press to see the next line. (as in Fig 6). Press + you can refer to the last number, and press + you can refer to the next number. If you hold them still they will increase or decrease continuously. The screen will display the test data you want to search for. Press and you can print it.

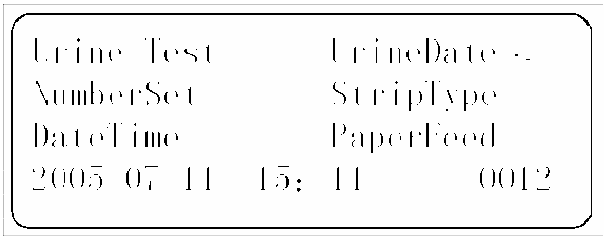

Figure 5

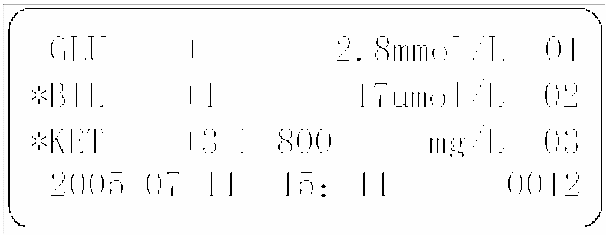

Figure 6

4.5 Selection of strip models

Select Strip Type in the operational main menu, press to enter into its operational interface as in Fig 7.

Figure 7

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Press or keys respectively. You can make a selection among four kinds of strip models i.e. these with 8 items, 9 items, 10 items, and 11 items, at the same time, TC-101 can display the models of strip selected automatically. Press key to return to the higher up menu.

4.6 Test of Urine Controls

Each TC-101 is recommended to test with Urine Control and to validate the test with the result provided.

CHAPTER 5

INSTRUCTION OF TESTING SPECIMEN

5.1 Specimen Testing

Caution: After the strip is taken out from the urine the excrescent urine shall be absorbed immediately with absorbing paper from its sides. After this being done, the strip can be put on the reagent strip rack for test, lest TC-101 will be damaged.

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Choose Urine Test in the operational menu and press , TC-101 will enter into test status and the screen will display (as in Fig 8). At this time, the time counter will count, the testing time will show in by “5” and will decrease progressively. When the testing time becomes 60, TC-101 will sound the buzz "B.B…" which will last for 2 seconds. During this time period, you shall dip the strip completely into the urine and put it into the reagent strip groove before the testing time becomes “21”. When the testing time become “18”, the reagent strip rack begins to act and conduct sample test. When the testing time becomes “0”, the test has been completed and at this time TC-101 will show automatically and will print the test results (as in Fig 4). For the limitation of the width of the screen, it can display results of three items each time. If you want to refer to the results of other items, you can press the key to turn the page. During completion of one sample test, the testing time will decrease continuously from “60” seconds to “00”. If new strip is put in before the testing time becomes “18”, the testing time will return to “00”, TC-101 will stop test and enter into a preparation status for tests. At this time, if you press , TC-101 will enter into test status (as in Fig 3), and the urine test can be done.

1) The time for dipping the strip into the urine is 2 seconds, don’t dip it in longer or shorter time, otherwise it may have influence to the results.
2) ⚠ Don’t expose the strip for long times, lest it shall deteriorate and influence the testing results. See the direction of the strip for detail.
3) The strip is one-off products and can’t be used repeatedly.
4) If TROUBLE occurs in process of the test, you shall check the list of malfunctions with the indications of TROUBLE, find out the reasons and fix the breakdowns before use.

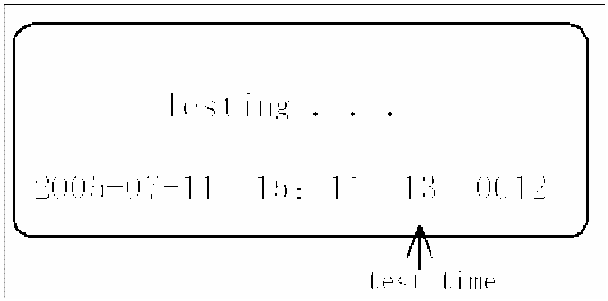

Figure 8

CHAPTER 6

DATA COMMUNICATION OF URITEK TC-101 URINE ANALYZER

6.1 Output of external data

TC-101 can also transmit data outward through the outward data outlet on its back. Users can connect it with corresponding computers through this outlet for statistical management. The explanations of outward data outlet are as follows:

Tandem outlet output: Standard RS232 level signal

Data code: ASCII

Output time: Results transmitted after printing

Output speed: 1200baud rate data 7figures, stop figures even

Output loop: photoelectric ionization

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⚠ Standard nine-pin computer tandem outlet cable shall be applied for the tandem outlet cables.

⚠ 2 legs are signal and 5 legs are ground.

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CHAPTER 7

MAINTENANCE OF THE URITEK TC-101

7.1 Maintenance of TC-101

This TC-101 is a kind of precision electronic and optical TC-101 and must be taken care of used and maintained by special personnel to ensure the normal operation of TC-101.

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> Caution:
> It is forbidden to use organic solution such as alcohol, diluting water, etc to clean the reagent strip bracket. It shall be cleaned and washed with soft rags, such as gauze. Otherwise, the reagent strip rack may be damaged. It is forbidden to bake the strip rack with baking stove, lest the rack will deformed.

Please clean the reagent strip rack regularly, and follow the steps below:

1. Turn the power off and pull out the plug. Draw out the reagent strip rack from TC-101.
2. Remove the dirty matter from the groove of the reagent strip rack with clean rags and then flush it with clean water repeatedly.
3. After the reagent strip rack is dried with rags or naturally dries, it can be installed into TC-101.

7.2 Point of attention for usage

I. TC-101 shall be installed at a place satisfying the work requirements.
II. Often clean TC-101 with clean and soft rags
III. Don't disassemble it randomly.
IV. Use clean sampling cup.
V. Use fresh urine sample.

VI. Concentrated urine samples must be diluted.
VII. The strip must be dipped completely into the urine, and dipping time in the urine shall be strictly controlled at 2 seconds.
VIII. The temperature adopted by TC-101 is 10 - 35 and it would be better if the temperature of the room and urine sample is kept within the scope.
IX. The urines contain Vitamin C and it may create a false appearance of low contents of glucose and occult blood.
X. It is forbidden to use any solution to clean and wash the screen. It shall be cleaned with clean and soft dry rag or paper.

CHAPTER 8

TROUBLESHOOT AND RESOLUTIONS

ERRORS	CAUSE	RESOLUTIONS
TROUBLE-1	Too Bright light Optical systems failure	Stop Status Consult with technical support to adjust lamp brightness
TROUBLE-3	Improper placing strip	Ensure the strip blanket is securely placed Ensure the last pad of the strip is after the line on the blanket.
TROUBLE-4	Poor light The optical light is too dim Abnormal color change on the pad Improper placing strip	Consult with technical support to adjust lamp brightness Test with urine control Ensure the last pad of the strip is after the line on the blanket.
TROUBLE-7	Incorrect strip type Abnormal color change on the pad	Test with urine control Select the correct strip type

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APPENDIX 1

TEST GRADIENT LIST OF URITEK TC-101

Test	Abbre-viation	Units	Printed/Displayed Results	
			Normal System	+ / - System
Glucose	GLU	mg/dL	NEGATIVE 100 250 500 ≥ 1000	NEGATIVE TRACE 1+ 2+ 3+
Bilirubin	BIL		NEGATIVE SMALL MODERATE LARGE	NEGATIVE 1+ 2+ 3+
Ketone	KET	mg/dL	NEGATIVE TRACE 15 40 ≥ 80	NEGATIVE TRACE 1+ 2+ 3+
Specific Gravity	SG		≤ 1.005 1.010 1.015 1.020 1.025 ≥ 1.030	≤ 1.005 1.010 1.015 1.020 1.025 ≥ 1.030
pH	pH		5.0 6.0 6.5 7.0 7.5 8.0 8.5	5.0 6.0 6.5 7.0 7.5 8.0 8.5
Protein	PRO	mg/dL	NEGATIVE TRACE 30 100 ≥ 300	NEGATIVE TRACE 1+ 2+ 3+
Urobilinogen	URO	E.U./dL	0.2 1 2 4 ≥ 8	0.2 1 2 4 ≥ 8
Nitrite	NIT		NEGATIVE POSITIVE	NEGATIVE POSITIVE
Blood	BLD		NEGATIVE TRACE SMALL MODERATE LARGE	NEGATIVE TRACE 1+ 2+ 3+
Leukocytes	LEU		NEGATIVE TRACE SMALL MODERATE LARGE	NEGATIVE TRACE 1+ 2+ 3+
Ascorbic Acid	VC	mg/dL	NEGATIVE 10 25 50 ≥ 100	NEGATIVE TRACE 1+ 2+ 3+
Color			YELLOW ORANGE RED GREEN BLUE BROWN	YELLOW ORANGE RED GREEN BLUE BROWN

ENGLISH - CONVENTIONAL
Units - Conventional

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Test	Abbre-viation	Units	Printed/Displayed Results					
			Normal System			+ / - System		
Glucose	GLU	mmol/L	NEGATIVE 5.5 14		28 ≥ 55	NEGATIVE TRACE 1+		2+ 3+
Bilirubin	BIL		NEGATIVE SMALL		MODERATE LARGE	NEGATIVE 1+		2+ 3+
Ketone	KET	mmol/L	NEGATIVE TRACE 1.5		3.9 ≥ 7.8	NEGATIVE TRACE 1+		2+ 3+
Specific Gravity	SG		≤ 1.005 1.010 1.015		1.020 1.025 ≥ 1.030	≤ 1.005 1.010 1.015		1.020 1.025 ≥ 1.030
pH	pH		5.0 6.0 6.5	7.0 7.5 8.0	8.5	5.0 6.0 6.5	7.0 7.5 8.0	8.5
Protein	PRO	g/L	NEGATIVE TRACE 0.3		1 ≥ 3	NEGATIVE TRACE 1+		2+ 3+
Urobilinogen	URO	µmol/L	3.2 16 32		64 ≥ 128	3.2 16 32		64 ≥ 128
Nitrite	NIT		NEGATIVE		POSITIVE	NEGATIVE		POSITIVE
Blood	BLD	Ery/µL	NEGATIVE TRACE Ca 25		Ca 80 Ca 200	NEGATIVE TRACE 1+		2+ 3+
Leukocytes	LEU	Leu/µL	NEGATIVE Ca 15 Ca 70		Ca 125 Ca 500	NEGATIVE TRACE 1+		2+ 3+
Ascorbic Acid	VC	mmol/L	NEGATIVE 0.6 1.4		3 ≥ 6	NEGATIVE TRACE 1+		2+ 3+
Color			YELLOW ORANGE RED		GREEN BLUE BROWN	YELLOW ORANGE RED		GREEN BLUE BROWN

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ENGLISH – S.I.
Units – International (S.I.)

APPENDIX 2

TERMS AND CONDITIONS

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Teco Diagnostics warrants to the original purchaser that this instrument will be free from defects in materials and workmanship for a period of 365 days (1 year) from the later of the date of original purchase or installation (except as noted below). During the stated 365-day period, Teco shall replace with a reconditioned unit or, at its option, repair at no charge a unit that is found to be defective. Teco shall not be responsible for shipping charges incurred in the repair of such instrument.

The Warranty is subject to the following exceptions and limitations:
The Warranty is limited to repair or replacement due to defects in parts or workmanship. Parts required which were not defective shall be replaced at additional cost, and Teco shall not be required to make any repairs or replace any parts that are necessitated by abuse, accidents, alteration, misuse, neglect, maintenance by anyone other than Teco, or failure to operate the instrument in accordance with instructions. Further, Teco assumes no liability from malfunction or damage to Teco instruments caused by the use of reagents other than reagents manufactured or recommended by Teco.
Teco reserves the right to make changes in design of this instrument without obligation to incorporate such changes into previously manufactured instruments.

Disclaimer of Warranties
This warrantee is expressly made in lieu of any and all other warranties express or implied (either in fact or by operation of law) including the warranties of merchantability and fitness for use, which are expressly excluded, and is the only warranty given by Teco.

Limitations of Liability

In no even shall Teco be liable for indirect, special or consequential damages, even if Teco has been advised of the possibility of such damages.

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